<u>AMENDMENTS TO THE CLAIMS</u>:

Please <u>AMEND</u> the claims as indicated below:

1. (Withdrawn) A reverse spreading device for reversely spreading complex base band signal, one being composed of an I (In-phase signal) component and another being composed of a Q (Quadrature phase signal) component and each being spread using spread codes of n-pieces of chips for one symbol signal comprising:

a first correlator having first delay devices whose number is an integral multiple of n-l and which sequentially shift said base band signal composed of said I component by delaying it at a predetermined time interval, having n-pieces of first multipliers each performing a multiplication between said base band signal composed of said I component shifted by said first delay devices and a spread code and having m-pieces of first adders each performing integration of an output from k-pieces of said first multipliers out of n-pieces of said first multipliers and outputting the result of said integration as an intermediate signal composed of said I component (m=n/k);

a second correlator having second delay devices whose number is the same as that of chips for one symbol signal sequentially shifted by delaying said base band signal composed of said Q component at a predetermined time interval, having n-pieces of second multipliers each performing a multiplication between said base band signal composed of said I component sequentially shifted by said second delay devices and said spread code and having m-pieces of second adders each performing integration of an output from k-pieces of said first multipliers out of n-pieces of said first multipliers and outputting the result of said integration as an intermediate signal composed of said Q component;

m-pieces of phase rotators each performing a rotation correction by phase-rotating m-pieces of said intermediate signals each being composed of said I component produced by each of said first correlators and m-pairs of complex intermediate signals containing m-pieces of intermediate signals composed of said Q component produced by said each of said second correlators, on a complex plane at a phase rotation angle at m-stages each being slid by a reference rotation angle for every pair of said complex intermediate signals;

a first adder to perform calculation of a correlation value composed of said I component by doing integration of said I component of said m-pieces of said complex intermediate signals obtained after said rotation correction is made by each of said phase rotators; and

a second adder to perform calculation of a correlation value composed of said Q component by doing integration of said Q component of said m-pieces of said complex intermediate signals obtained after said rotation correction of each of said phase rotators is made.

2. (Withdrawn) A reverse spreading device for reversely spreading complex base band signals, one being composed of an I (In-phase signal) component and another being composed of a Q (Quadrature phase signal) component and each being spread using spread codes of n-pieces of chips for one symbol signal comprising:

a first multiplier to sequentially perform a multiplication between base band signals composed of said I component and said spread codes of n-pieces of chips;

a first correlator to produce m-pieces of intermediate signals composed of said I component by sequentially integrating said multiplied value obtained by said first multiplier for every k-pieces and by using said multiplied value as said intermediate signal and to output them as (m=n/k);

a second multiplier to sequentially perform a multiplication between said base band signals composed of said Q component and said spread codes of n-pieces of chips;

a second correlator to produce m-pieces of intermediate signals composed of said Q component by sequentially integrating said multiplied value obtained by said first multiplier for every k-pieces multiplied values and by using said multiplied value as said intermediate signals and to output them;

a phase rotator to perform a rotation correction by phase-rotating m-pieces of complex intermediate signals containing said intermediate signal composed of said I component and said intermediate signal each composed of said Q component on a complex plane at a phase rotation angle at m-stages each being slid by a reference rotation angle for every pair of said complex intermediate signals;

a first adder to perform calculation of a correlation value composed of said I component by doing integration of said I component of said m-pieces of said complex intermediate signal obtained after said rotation correction by each of said phase rotators is made; and

a second adder to perform calculation of a correlation value composed of said Q component by doing integration of said Q component of said m-pieces of said complex intermediate signals obtained after said rotation correction by each of said phase rotators is made.

Cancel Claims 3 and 4.

5. (Withdrawn) The timing detecting device comprising said reverse spreading device claimed in Claim 1 and a peak detecting circuit to detect spreading timing based on sizes of correlation values of said I component and said Q component obtained by said reverse spreading in said reverse spreading device.

6. (Withdrawn) The channel estimating device comprising said reverse spreading device claimed in Claim 1 and a rotation correcting circuit to detect a phase error contained in a complex symbol obtained by said reverse spreading device and to perform correction of said phase error.

7. (Withdrawn) The timing detecting device comprising said reverse spreading device claimed in Claim 2 and a peak detecting circuit to detect spreading timing based on sizes of correlation values of said I component and said Q component obtained by said reverse spreading in said reverse spreading device.

8. (Withdrawn) The channel estimating device comprising said reverse spreading device claimed in Claim 2 and a rotation correcting circuit to detect a phase error contained in a complex symbol obtained by said reverse spreading device and to perform correction of said phase error.

9. (Currently Amended)A timing detecting device, comprising: the reverse spreading device of Claim [3] 19; and a peak detecting circuit configured to receive the correlation value of the I component and the correlation value of the Q component, and detect spreading timing as a function of sizes of the correlation values of the I and Q components.

Cancel Claim 10.

11. (Withdrawn) A method for measuring a frequency error being a difference between a reference frequency of a receiver and a reference frequency of a sender comprising steps of:

shifting sequentially a base band signal composed of an I (In-phase signal) component and a base band signal composed of a Q (Quadrature phase signal) component and performing a multiplication between said shifted said base band signals each being composed of said I component or said Q component;

performing integration of k-pieces of multiplied values out of n-pieces of multiplied values obtained and producing m-pieces of intermediate signals composed of an I component (m=n/k);

performing a rotation correction by rotating phases of m-pairs of complex intermediate signals including m-pieces of intermediate signals composed of said I component and m-pieces of intermediate signals composed of said Q component at a phase rotation angle at m-stages each being slid by a reference rotation angle for every one pair of complex intermediate signals;

calculating a correlation value of said I component and a correlation value of said Q component by integrating said I component and said Q component of said m-pieces of said complex intermediate signals obtained after said rotation correction is made; and

calculating a power value of a complex symbol based on said correlation values of said I component and said Q component and selecting said reference rotation angle so that

said power value becomes maximum and then detecting said frequency error based on said reference rotation angle selected.

12. (Withdrawn) A method for measuring a frequency error being a difference between a reference frequency of a receiver and a reference frequency of a sender comprising steps of:

performing a multiplication between base band signals, one being composed of an I component of n-pieces of chips and another being composed of a Q component of n-pieces of chips and spread code of n-pieces of chips and producing m-pieces of intermediate signals, one being composed of said I component and said Q component by integrating a multiplied value for every k-pieces of said multiplied value and to use an integrated value as an intermediate signal (m=n/k) ;

performing a rotation correction by rotating phases of m-pairs of complex intermediate signals including m-pieces of intermediate signals composed of said I component and m-pieces of intermediate signals composed of said Q component at a phase rotation angle at m-stages each being slid by a reference rotation angle for every one pair of complex intermediate signals;

calculating a correlation value of said I component and a correlation value of said Q component by integrating said I component and said Q component of said m-pieces of said complex intermediate signals obtained after said rotation correction is made; and

calculating a power value of a complex symbol based on said correlation values of said I component and said Q component and selecting said reference rotation angle so that said power value becomes maximum and then detecting said frequency error based on said reference rotation angle selected.

Cancel Claim 13.

14. (Withdrawn) An AFC (Automatic Frequency Control) method to control a frequency of a reference frequency signal of a mobile station so that a frequency error measured by said frequency error measuring method claimed in claim 11.

15. (Withdrawn) An AFC (Automatic Frequency Control) method to control a frequency of a reference frequency signal of a mobile station so that a frequency error measured by said frequency error measuring method claimed in claim 12.

Cancel 16.

17. (New) A method for measuring a frequency error being a difference between a reference frequency of a receiver and a reference frequency of a sender comprising steps of:

counting how many chips of complex base band signals are to be input;

performing a rotation correction in a step-by-step manner by rotating a phase of said complex base band signal on a complex plane at a phase rotation angle at m-stages each being slid by a reference rotation angle being an angle obtained by dividing a rotation angle (2π)f a revolution to M portions every time said counted number of the chips increascs by K-chips;

producing a multiplied value by multiplying the rotation corrected complex base band signals by spread signals;

producing a correlation value of I component of said multiplied value and a correlation value of Q component of said multiplied value by adding said multiplied value in accumulative manner for every I component and every Q component during one symbol period;

calculating a power value of the complex base band signal in said one symbol period based on said correlation values of said I component and said Q component; and

selecting said reference rotation angle so that said power value becomes maximum.

18. (New) The method according to claim 17, further comprising detecting said frequency error based on said reference rotation angle selected.

19. (New) A reverse spreading device for reversely spreading complex base band signals, each of said complex base band signals being composed of an I component and a Q component and being spread by spread codes, said device comprising:

a frequency error correcting to count how many chips of said complex base band signals to be input and to perform a rotation correction in a step-by-step manner by rotating a phase of said complex base band signals on a complex plane at a phase rotation angle at m-stages each being slid by a reference rotation angle every time a count of the chips increases by K-chips;

a spread code multiplier producing a multiplied value by multiplying each of the rotation corrected complex base band signals by said spread codes;

two accumulative adders to produce a correlation value of I component of said multiplied value and a correlation value of Q component of said multiplied value by performing accumulative addition of said multiplied value for one symbol period;

a power calculator calculating a power value of said complex base band signal in said one symbol period based on said correlation values of said I component and said Q component; and

a selector selecting said reference rotation angle so that said power value becomes maximum.

20. (New) The device according to claim 19, further comprising a frequency error detector detecting a frequency error based on said reference rotation angle selected by said selector.